

Serial/Patent No.: 10/041,942
Filing Date: 1/7/02
Atty Docket: SPLX.P0046
Applicant(s): Steven Teig

Atty/Secty: MA/sl
Date Mailed: 4/23/2003

TITLE: Method and Apparatus for Pre-Computing Routes for Multiple Wiring Models

The following has been received by the U.S. Patent & Trademark Office on the date stamped hereon:

1. Transmittal Form
2. Information Disclosure Statement (2 pages)
3. Form PTO-1449 (5 pages)
4. (87) cited references

Serial/Patent No.: 10/040,054
Filing Date: 1/4/02
Atty Docket: SPLX.P0047
Applicant(s): Steven Teig

Atty/Secty: MA/sl
Date Mailed: 4/23/2003

TITLE: Method and Apparatus for Storing Routes

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Serial/Patent No.: 10/039,586
Filing Date: 1/4/02
Atty Docket: SPLX.P0048
Applicant(s): Steve Teig

Atty/Secty: MA/sl
Date Mailed: 4/23/2003

TITLE: Method and Apparatus for Storing Routes for Groups of Related Net Configurations

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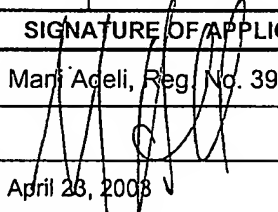
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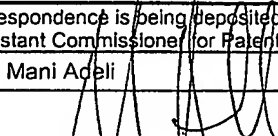


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PTO/SB/21 (6-98) (modified)
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TRANSMITTAL FORM <i>(to be used for all correspondence after initial filing)</i>	Application Number	10/039,586	
	Filing Date	1/4/02	
	First Named Inventor	Steve Teig	
	Group Art Unit	2661	
	Examiner Name	<none yet>	
Total Number of Pages in This Submission	*	Attorney Docket Number	SPLX.P0048

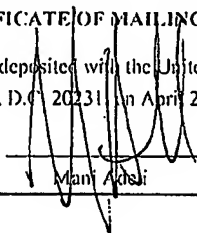
Enclosures (Check all that apply)		
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Date	April 23, 2003	

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PATENT
Docket No. SPLX.P0048

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Mark A. Adasi

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Steve Teig

Serial No.: 10/039,586

Filing Date: 1/4/02

For: METHOD AND APPARATUS FOR
STORING ROUTES FOR GROUPS OF
RELATED NET CONFIGURATIONS

**INFORMATION DISCLOSURE
STATEMENT UNDER 37 C.F.R. § 1.97**

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Pursuant to 37 C.F.R. § 1.97 and § 1.98, applicants submit for consideration in the above-identified application the documents listed on the attached Form PTO-1449. Copies of the documents are also submitted herewith. The Examiner is requested to make these documents of record. Applicants would appreciate the Examiner initialing and returning the Form PTO-1449, indicating that the information has been considered and made of record herein.

This Information Disclosure Statement is submitted within three months of the application filing date or before the mailing date of a first Office Action on the merits; accordingly, no fee or separate requirements are required.

This Information Disclosure Statement under 37 C.F.R. § 1.97 is not to be construed as a representation that: (i) a complete search has been made; (ii) additional information material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the above information constitutes prior art to the subject invention.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 50-1128 referencing SPLX.P0048. However, the Assistant Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Dated: April 23, 2003

Respectfully submitted,

By:


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Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>				Application Number	10/039,586
				Filing Date	1/4/02
				First Named Inventor	Steve Teig
				Group Art Unit	2661
				Examiner Name	
Sheet	1	of	1	Attorney Docket Number	SPLX.P0048

U.S. PATENT DOCUMENTS						
Examiner* Initials	Cite No. ¹	U.S. Patent Document Number Kind Code ² (if known)		Name of Patentee or Applicant of Cited Document	Date of Publication MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	2001/	A1	Scepanovic et al.	06-14-01	
	2.	0003843		Linsker	09-30-86	
	3.	4,615,011		Shimoyama	06-16-87	
	4.	4,673,966		Linsker	11-01-88	
	5.	4,782,193		Nakajima	08-08-89	
	6.	4,855,929		Corbin II et al.	03-17-92	
	7.	5,097,422		Finnerty	10-05-93	
	8.	5,251,147		Arima et al.	01-25-94	
	9.	5,281,151		Thornberg	11-01-94	
	10.	5,360,948		Satoh et al.	12-20-94	
	11.	5,375,069		Rostoker	07-02-96	
	12.	5,532,934		Scepanovic	11-26-96	
	13.	5,578,840		Hirano	05-27-97	
	14.	5,633,479		Ashida et al.	05-27-97	
	15.	5,634,093		Rostoker et al.	06-03-97	
	16.	5,636,125		Rostoker et al.	07-22-97	
	17.	5,650,653		Sekiyama et al.	08-12-97	
	18.	5,657,242		Fuchida et al.	03-03-98	
	19.	5,723,908		Rostoker et al.	04-21-98	
	20.	5,742,086		Hershberger et al.	05-26-98	
	21.	5,757,656		Rostoker et al.	07-07-98	
	22.	5,777,360		Rostoker et al.	09-22-98	
	23.	5,811,863		Rostoker et al.	10-13-98	
	24.	5,822,214		Kobayashi et al.	01-12-99	
	25.	5,859,449		Scepanovic et al.	04-27-99	
		5,898,597				

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Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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				Filing Date	1/4/02
				First Named Inventor	Steve Teig
				Group Art Unit	2661
				Examiner Name	
Sheet	2	of	2	Attorney Docket Number	SPLX.P0048

U.S. PATENT DOCUMENTS						
	26.	5,914,887		Scepanovic et al.	06-22-99	
	27.	5,973,376		Rostoker et al.	10-26-99	
	28.	6,035,108		Kikuchi	03-07-00	
	29.	6,058,254		Scepanovic et al.	05-02-00	
	30.	6,067,409		Scepanovic et al.	05-23-00	
	31.	6,068,662		Scepanovic et al.	05-30-00	
	32.	6,123,736		Pavisc et al.	09-26-00	
	33.	6,134,702		Scepanovic et al.	10-17-00	
	34.	6,155,725		Scepanovic et al.	12-05-00	
	35.	6,175,950	B1	Scepanovic	01-16-01	
	36.	6,216,252	B1	Dangelo et al.	04-10-01	
	37.	6,230,306	B1	Raspopovic et al.	05-08-01	
	38.	6,247,167	B1	Raspopovic et al.	06-12-01	
	39.	6,260,179	B1	Ohsawa et al.	07-10-01	
	40.	6,262,487	B1	Igarashi et al.	07-17-01	
	41.	6,289,495	B1	Raspopovic	09-11-01	
	42.	6,301,686	B1	Kikuchi et al.	10-09-01	
	43.	6,327,694	B1	Kanazawa	12-04-01	
	44.	6,378,121	B2	Hiraga	04-23-02	
	45.	6,385,758	B1	Kikuchi et al.	05-07-02	
	46.	6,401,234	B1	Alpert et al.	06-04-02	
	47.	6,405,358	B1	Nuber	06-11-02	
	48.	6,412,097	B1	Kikuchi et al.	06-25-02	
	49.	6,412,102	B1	Andreev et al.	06-25-02	
	50.	6,436,804	B2	Igarashi et al.	08-20-02	
	51.	6,446,245	B1	Xing et al.	09-03-02	
	52.	6,463,575	B1	Takahashi	10-08-02	

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Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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				First Named Inventor	Steve Teig
				Group Art Unit	2661
				Examiner Name	
Sheet	3	of	3	Attorney Docket Number	SPLX.P0048

U.S. PATENT DOCUMENTS						
	53.	6,516,455	B1	Teig et al.	02-04-03	
	54.	2003/0025 205	A1	Shively	02-06-03	

FOREIGN PATENT DOCUMENTS								
Examiner* Initials	Cite No. ¹	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Office ³	Number ⁴	Kind Code (if known) ⁵				
	55.	JP	64-15947		Ouchi	01-19-89		
	56.	JP	04000677		Fujiwara et al.	01-1992		

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				First Named Inventor	Steve Teig
				Group Art Unit	2661
				Examiner Name	
Sheet	4	of	4	Attorney Docket Number	SPLX.P0048

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner* Initials	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
	57.	A.H. Farrahi, et al., Quality of EDA CAD Tools: Definitions, Metrics and Directions, Quality Electronic Design, 2000, Proceedings of the first International Symposium on March 2000, pp 395-405.	
	58.	A. Vannelli, et al., An adaptation of the interior point method for solving the global routing problem, 2/1991, IEEE pp 193-203.	
	59.	B. Berger, et al., Nearly Optimal Algorithms and Bounds for Multilayer Channel Routing, Journal of the Association for Computing Machinery, pp. 500-542, March 1995.	
	60.	C. Chiang, et al., Wirability of Knock-Knee Layouts with 45° Wires, IEEE Transactions on Circuits and Systems, Vol. 38, Issue 6, pp 613-624, June 1991.	
	61.	G. Overtone, EDA Underwriter 2 Finding Space in a Multi Layer Board, Electronic Engineering, Morgan-Grampian LTD, vol. 67, No. 819, pp 29-30.	
	62.	G.D. Hachtel et al., Linear Complexity Algorithms for Hierarchical Routing, 1/89, IEEE pp 64-80.	
	63.	J.D. Cho, et al., Four-Bend Top Down Global Routing, IEEE, pp 793-802, 1998.	
	64.	J. Su et al., Post Route Optimization for Improved Yield Using Rubber-Band Wiring Model, 1997 International Conference on Computer-Aided Design, pp 700-706, November 1997.	
	65.	J. Vicente, RSR: A New Rectilinear Steiner Minimum Tree Approximation for FPGA Placement and Global Routing, Proceedings of the 24 th Euro Micro Conference, pp 192-195, August 1998.	
	66.	K. Powers et al., The 60° Grid: Routing Channels in Width d/square root 3, VLSI, 1991, Proceedings., First Great Lakes Symposium on Kalamazoo, MI, USA, pp 214-291, March 1991.	
	67.	M. Alexander et al., Performance-Oriented Placement and Routing for field-programmable gate arrays, Proceedings of the European Design Automation Conference, pp 80-85, 1995. ✓	
	68.	M. Alexander et al., Placement and Routing for Performance-Oriented FPGA Layout, VLSI Design, Vol. 7, No. 1, 1998. ✓	
	69.	M. Igarashi et al., A Diagonal-Interconnect Architecture and Its Application to RISC Core Design, 2002 IEEE Solid-State Circuits Conference, pp 210-460, February 2002.	
	70.	P. Dood, et al., A Two-Dimensional Topological Compactor with Octagonal Geometry, 28 th ACM/IEEE Design Automation Conference, pp 727-731, July 1991	
	71.	P. Parakh, et al., Congestion Driven Quadratic Placement, Proceedings of Design Automation Conference, 1998, pp 275-278.	
	72.	R. Putatunda et al., VITAL: Fully Automatic Placement Strategies for Very Large Semicustom Designs, Proceedings of the International Conference on Computer Design: VLSI in Computers and Processors, pp 434-439 October 1988.	

Examiner Signature		Date Considered	
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				Group Art Unit	2661
				Examiner Name	
Sheet	5	of	5	Attorney Docket Number	SPLX.P0048

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS		
73.	S. Dutt, et al., Probability-Based Approaches to VLSI Circuit Partitioning, IEEE Trans. On Computer Aided Design of IC's and Systems, Vol. 19, No. 5, May 2000, pp 534-549.	
74.	Y. Sekiyama et al., Timing-Oriented Routers for PCB Layout Design of High-Performance Computers, International Conference on Computer Aided Design, pp 332-335, November 1991.	
75.	C. Leiserson et al., Algorithm for Routing and Testing Routability of Planar VLSI Layouts, pp 69-78, May 1985.	
76.	S. Das et al., Channel Routing in Manhattan-Diagonal Model, 9 th International Conference on VLSI Design, January 1996. pp 43-48.	
77.	W. Wei-Ming Dai et al., Routability of a Rubber-Band Sketch. 28 th ACM/IEEE Design Automation Conference, 1991. pp 45-65.	
78.	H. Chen, Routing L-Shaped Channels in Nonslicing-Structure Placement. 24 th ACM/IEEE Design Automation Conference, pp 152-165, 1987.	
79.	I. Tollis, Techniques for Wiring in Non-Square Grids, pp 66-69. May 1989.	
80.	E. Lodi et al., A 2d Channel Router for the Diagonal Model, pp 111-125, April 1991.	
81.	E. Lodi et al., Routing in Times Square Mode, pp 41-48, June 1990.	
82.	K. Cheng-Kok et al., Manhattan or Non Manhattan? A Study of Alternative VLSI Routing Architectures. pp 47-52, 2000	
83.	E. Lodi et al., Routing Multiterminal Nets in a Diagonal Model, pp 899-902, 1988.	
84.	D. Staepelaere et al., Surf: A Rubber-Band Routing System for Multichip Modules. pp 18-26, 1993.	
85.	S. Das et al., Routing of L-Shaped Channels, Switch boxes and Staircases in Manhattan-Diagonal Model, pp 65-70m January 1998.	
86.	W. Schiele et al., A Gridless Router for Industrial Design Rule, 27 th ACM/IEEE Design Automation Conference, pp 626-631, 1990.	
87.	J. Nester, A New Look at Hardware Maze Routing, Proceedings of the 12 th ACM Symposium on Great Lakes Symposium on VLSI, pp 142-147, April 2002.	

Examiner Signature	Date Considered
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